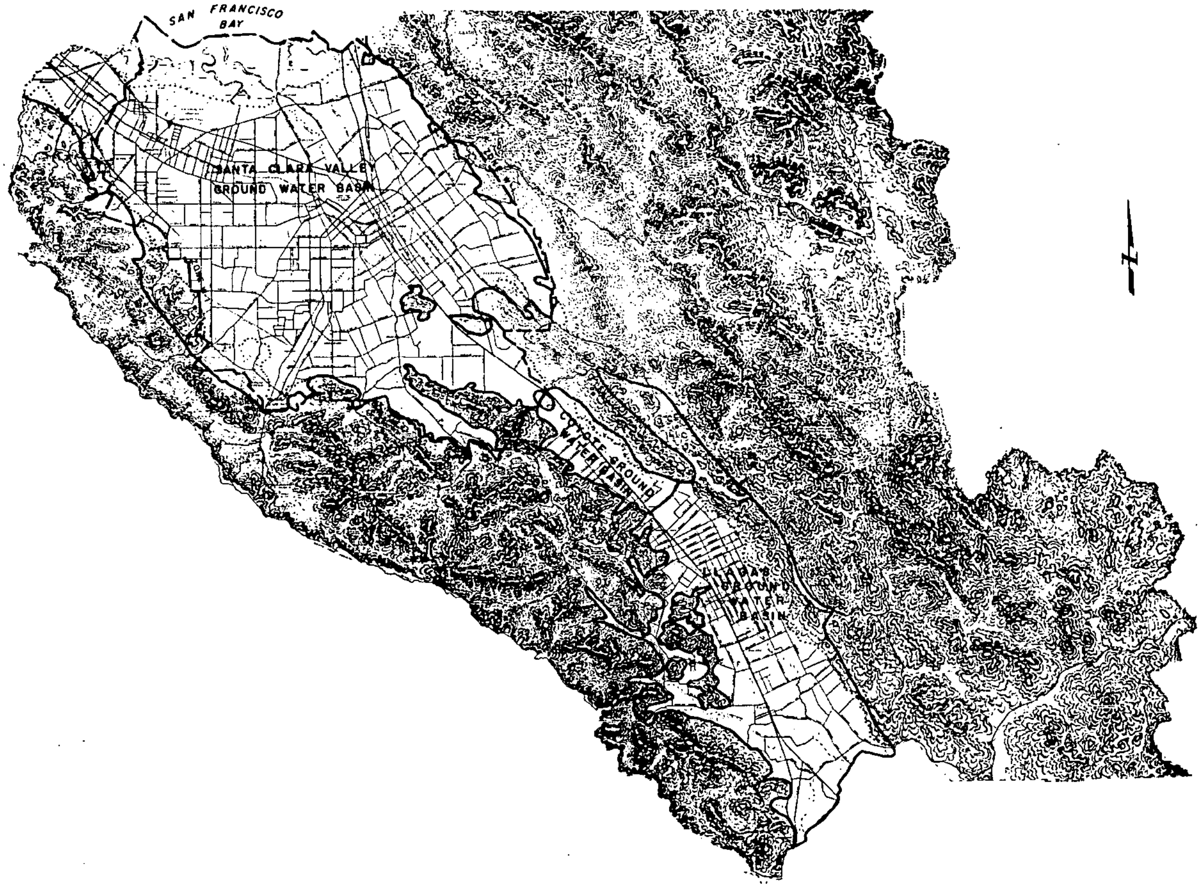
ANNUAL SURVEY REPORT ON GROUND WATER CONDITIONS

1965


SAN FRANCISCO BAY
SANTA CLARA VALLEY GROUND WATER BASIN
COYOTE GROUND WATER BASIN
LLAGAS GROUND WATER BASIN

SANTA CLARA COUNTY FLOOD CONTROL AND WATER DISTRICT

March 1965

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Annual Survey Report on Ground Water Conditions - 1965.
Santa Clara County Flood COntrol and Water District. March 1965.

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Santa Clara County Flood Control
and Water District

ANNUAL SURVEY REPORT

on

GROUND WATER CONDITIONS

1965

March 1965

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2 Recorded Seasonal Precipitation and Accumulated Departure from the Average at San Jose

3 Elevation of Ground Water in Wells

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santa clara county
FLOOD CONTROL AND WATER DISTRICT

DONALD K. CURRLIN
MANAGER - COUNSEL
70 WEST HEDDING STREET
SAN JOSE, CALIF. 95110
TELEPHONE 299-2031

March 1965

Honorable Board of Supervisors
Santa Clara County Flood Control
and Water District
70 West Hedding Street
San Jose 10, California

Gentlemen:

I am pleased to transmit to you the District Engineer's "Annual Survey Report on Ground Water Conditions" in the Santa Clara County Flood Control and Water District for 1965. The report was prepared under the authority of Section 26.5 of the District Act and is the third of an annual series required as a prerequisite to the levy of a ground water charge for the production of water from the ground water supplies within a zone or zones of the District.

The reported investigation finds that an overdraft condition continues to exist throughout the major ground water basins of the District. The average seasonal overdraft for the current (1964-65) water year is estimated to be 38,000 acre-feet for Zone W-1 (which covers most of the Santa Clara Valley Ground Water Basin), zero acre-feet for the Coyote Ground Water Basin, and 11,000 acre-feet for the Llagas Ground Water Basin. The accumulated overdraft as of the end of the preceding (1963-64) water year was estimated to be about 707,000 acre-feet for the Zone W-1 Basin, zero acre-feet for the Coyote Ground Water Basin, and 7,500 acre-feet for the Llagas Ground Water Basin. These overdrafts exist even though imported water from the Hetch Hetchy Aqueduct of the San Francisco Water Department is available to some north County areas. There is no hope of any major alleviation of these annual overdrafts or amounts of accumulated overdrafts until additional supplemental imported water supplies are available.

Imported water will be available from the South Bay Aqueduct of the State Water Project in May 1965. About 7,400 acre-feet will be delivered in the current (1964-65) water year and about 35,500 acre-feet in the ensuing (1965-66) water year. The Central Pipeline of the In-County Water Distribution System will be completed in April in time to deliver this imported water to the percolation areas of Penitencia Creek and Los Gatos Creek. The first unit of the Almaden Valley Pipeline will be advertised for construction proposals in March 1965 and completed during 1965 to deliver imported water to the Los Capitancillos Percolation Ponds and Guadalupe Creek. The report recommends continued construction and engineering design of the remainder of the In-County Water Distribution System in order that the needed additional supplemental water may be imported and put to use.

It is also recommended that a county-wide tax of five cents per one hundred dollars of assessed valuation be levied in the ensuing (1965-66) water year to defray a portion of the allocated capital costs of the South Bay Aqueduct, and that a ground water charge of $5.00 per acre-foot for agricultural extractions and $16.00 per acre-foot for municipal and industrial extractions be levied in the ensuing (1965-66) water year to finance the In-County Water Distribution System and the purchase of imported water from the South Bay Aqueduct.

I concur in the findings and recommendations presented in this report, and recommend that the suggested ad valorem tax and ground water charges be levied for the Fiscal Year 1965-66.

Sincerely yours,

Donald K Currlin

Manager-Counsel

Acknowledgement

Valuable assistance and much of the data used in this investigation were contributed by agencies of the State of California and of the County of Santa Clara, by cities, and by private companies and individuals. This cooperation is gratefully acknowledged.

Special mention is made of the helpful cooperation of the Santa Clara Valley Water Conservation District, the South Santa Clara Valley Water Conservation District, the Sanitation Districts of Santa Clara County, the San Jose Water Works, and the Santa Clara County Planning Department.

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santa clara county
FLOOD CONTROL AND WATER DISTRICT

DONALD K. CURRLIN
MANAGER - COUNSEL
70 WEST HEDDING STREET
SAN JOSE, CALIF. 95110
TELEPHONE 299-2031

March 15, 1965

Mr. Glen Dodson
Santa Clara Valley Water
  Conservation District
15420 Almaden Road
San Jose, California

Dear Mr. Dodson:

The enclosed copy of our "Annual Survey Report on Ground Water Conditions" is for your information and use.

This report was presented to the Board of Supervisors on 8 March 1965 and is in accord with Section 26.6 of the District Act. A public hearing on this report will be held on 12 April 1965.

I appreciate the courteous assistance you provided our staff and thank you for the data you made available for our use.

Should you have any questions concerning the information in this report or desire further information, please contact us.

Sincerely yours,

Donald K Currlin

Manager-Counsel

Enclosure

INTRODUCTION

This is the third annual survey report on ground water conditions in the Santa Clara County Flood Control and Water District and the Zones thereof. It has been prepared in accordance with the requirements of Section 26.5 of the District Act.

The purpose of this report is to inform the District Board of Supervisors of the ground water conditions in the District during the preceding water year*, 1963-64, and to assist the Board in its determinations of water supply and water use as of the last day of this water year, 1964-65, and prediction of water supply and water use for the ensuing water year, 1965-66. The information will provide a basis for the Board's determination of ground water charges for the ensuing water year, 1965-66.

The Santa Clara County Flood Control and Water District includes all of Santa Clara County. Within the District three major interconnected ground water basins have been delineated. There are other ground water basins within the District, such as Antelope Valley in the northeast corner of the County, and many localized ground water supplies are tapped in the mountains and small valleys of the District. However, the use of these supplies at present is small. Therefore, only the major ground water basins are considered within the scope of this report; they are delineated on Plate 1.

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*Water year is defined in Section 26.1 of the District Act as "July 1st of one calendar year to June 30th of the following calendar year."

The only water importation zone in the District overlies essentially all of the Santa Clara Valley Ground Water Basin. This Zone was formed 11 September 1962 and is known as Zone W-1. Its boundaries are shown on Plate 1.

Zone W-2 was formed on 11 February 1963, encompassing all water producing facilities that will benefit from the importation of water via the South Bay Aqueduct. The boundaries of Zone W-2 are coterminous with Zone W-1. Within Zone W-2 all water producing facilities are located, registered with the District, and a charge can be levied on water production to support the cost of importing and distributing supplemental water.

Because of the close relationship between the boundaries of the water importation Zones and the Santa Clara Valley Ground Water Basin, this report considers them synonymous and reports the water supply and water use for Zone W-1 (and thereby Zone W-2) as a ground water basin.

The following report is a summarization of the volumes of basic data and detailed computations made to determine the ground water conditions and water supply and water use information required by Section 26.5 of the District Act. The required information is developed and reported in three sections followed by a summary of findings and recommendations. For a detailed explanation of the computations and relationships between water supply, water disposal, overdraft, ground water storage, and ground water extractions, reference is made to the previous Annual Survey Reports.

WATER SUPPLY AND DISPOSAL

Precipitation and runoff measurements made at sampling stations in Santa Clara County indicate that the local water supply during the 1963-64 water year was below normal. The seasonal precipitation recorded by the U. S. Weather Bureau Station at San Jose was about 74 percent of the long-time mean of 14.04 inches while the precipitation station at Gilroy recorded about 75 percent of the long-time mean of 19.89 inches. Precipitation on a District wide basis averaged about 69 percent of the long-time mean. The seasonal precipitation and accumulated departure of the seasonal precipitation from the mean for San Jose is shown on Plate 2.

Runoff from streams originating on the west slopes of the Santa Cruz Mountains and in the Mount Hamilton Range on the east side of the valley were far below the long term average during the 1963-64 water year. The below normal precipitation throughout the County was deposited as light intensity rains evenly spaced throughout the rainfall season and produced abnormally low runoff. There was very little runoff available for recharge into the ground water basins of Santa Clara County.

Runoff from all valley streams filled only a small portion of the storage available in surface reservoirs of the

Santa Clara Valley, Coyote and Llagas Ground Water Basins. The total quantity of water stored in a potential storage capacity of 174,400 acre-feet in all County reservoirs was only 19,100 acre-feet. During the 1963-64 irrigation season 5,400 acre-feet was stored for release to the Santa Clara Valley Ground Water Basin; 6,400 acre-feet to the Coyote Ground Water Basin; and 7,300 acre-feet to the Llagas Ground Water Basin.

The actual water supply and disposal in the 1963-64 water year is not significant in the determination of the long term average seasonal overdraft. However, it is of interest to compare actual occurrences with the significant long term averages which are presented later. The actual annual water supply conditions in 1963-64 are summarized in Table 1. They indicate in general that the water supply did not meet the needs for water during the water year 1963-64 and a total deficiency throughout the District of 170,800 acre-feet developed. This deficiency was supplied by ground water taken from storage but is not necessarily indicative of overdraft.

The Santa Clara County Flood Control and Water District is dependent on the long term average seasonal water supply plus surface import to meet the demands for water. To evaluate the long term seasonal water supply for the use in water resources management it is necessary to adjust the actual

TABLE 1

SUMMATION OF THE ANNUAL ITEMS OF WATER SUPPLY AND WATER DISPOSAL TO THE ZONES OR GROUND WATER BASINS OF THE DISTRICT FOR THE WATER YEAR 1963-64

Values in Acre-Feet

Item	Ground Water Basin			Totals
	Zone W-1	Coyote	Llagas	
Water Supply				
Precipitation	158,900	9,000	73,600	241,500
Stream & Surface Inflow	102,300	*48,200	31,000	181,500
Subsurface Inflow	34,600	3,200	12,900	50,700
Import	13,000	0	0	13,000
Subtotal (to be added)	308,800	60,400	117,500	486,700
Water Disposal				
Consumptive Use	327,100	21,400	118,400	466,900
Stream Outflow	36,100	39,900	12,300	88,300
Subsurface Outflow	0	12,000	13,000	25,000
Export	76,400	0	2,000	78,400
Subtotal (to be subtracted)	439,600	73,300	145,700	658,600
Surplus (+) or Deficiency (-)	-130,800	-12,900	-28,200	-170,800

*Includes storage releases from Anderson Reservoir.

seasonal averages to what the averages would be if the present (1964) conditions had existed over the averaging period. The same type of adjustment must be made to the items of water disposal in order to determine the magnitude of the average seasonal overdraft, if one exists.

The long term average seasonal water supply and water disposal under present conditions is given in Table 2. The totals indicate a deficiency in water supply; the long term average deficiency under present conditions is less than the actual deficiency that occurred in 1963-64. This long term average seasonal deficiency is overdraft.

TABLE 2

SUMMATION OF THE AVERAGE SEASONAL ITEMS OF WATER SUPPLY AND DISPOSAL UNDER PRESENT CONDITIONS TO THE ZONES OR GROUND WATER BASINS OF THE DISTRICT

Values in Acre-Feet

Item	Ground Water Basin			Totals
	Zone W-1	Coyote	Llagas	
Water Supply				
Precipitation	219,900	14,500	94,100	328,500
Stream & Surface Inflow	180,600	67,600	57,700	305,900
Subsurface Inflow	27,800	4,300	14,200	46,300
Import	13,000	0	0	13,000
Subtotal (to be added)	441,300	86,400	166,000	693,700
Water Disposal				
Consumptive Use	329,100	21,600	120,600	471,300
Stream Outflow	81,500	47,100	39,100	167,700
Subsurface Outflow	0	18,500	15,100	33,600
Export (Sewage)	76,400	0	2,000	78,400
Subtotal (to be subtracted)	487,000	87,200	176,800	751,000
TOTAL*	-45,700	-800	-10,800	-57,300

---

*(-) indicates loss in storage

GROUND WATER CONDITIONS

The seasonal variations in water supply are regulated naturally by the large storage space in the ground water basins of the District. The ground water table fluctuates in response to the conditions of water supply and water disposal. Extractions in excess of the supply to the ground water basin causes the ground water table to be lowered. A long term lowering of the ground water table indicates that ground water overdraft conditions exist. The conditions of the ground water basins as represented by the ground water table fluctuations is presented in this section.

Ground Water Table Conditions

Present and historical ground water conditions are reflected in the continuous records of the elevation of ground water in wells. The accumulated effect of each year's water supply and water disposal is shown by the seasonal changes in elevation of the ground water table. In the Santa Clara Valley and Llagas Ground Water Basins there are two large areas of confined ground water where water level elevations reflect a change in water pressure in the aquifer. In the remaining areas of these two basins and the Coyote Ground Water Basin the aquifers are unconfined and changes in water levels reflect a change in the amount of water in storage.

Changes in the elevation of ground water levels in two wells located in the Santa Clara Valley Ground Water Basin are shown on Plate 3. The location of these wells are shown on Plate 4. The ground water elevations in Well No. 7S/1E-35E located in the unconfined or forebay area show a general decline in the amount of water in storage since 1958. However, Well No. 6S/1W-27P located in the pressure area shows a continuous decline in the pressure surface since 1942 with a rate of decline in the period since 1958 more rapid than the decline in the unconfined zone. This condition indicates that the confined aquifers lack the capacity to transport ground water from the areas of recharge to the areas of discharge and the seasonal safe yield of the water supply has been exceeded. To correct this condition it is necessary to reduce extractions, raise the pressure levels to an elevation safe from possible ground water quality degradation and establish a water table slope between the unconfined and confined areas that does not exceed the safe yield of the basin.

The configuration of the ground water table in 1964 for the three ground water basins of the District is indicated by the contours on Plate 4.

Changes in Ground Water Storage

During the 1963-64 water year the water supply was below normal and the water table dropped in elevation. The difference in the elevation of the ground water table from one period in time to another in the unconfined area multiplied by the appropriate specific yield (the amount of water a saturated unit volume of water bearing sediment would yield under the pull of gravity) will result in the change in ground water storage for that period. Making this calculation for the 1963-64 water year showed that during the year about 131,000 acre-feet was removed from storage in the Santa Clara Valley Ground Water Basin, about 13,000 acre-feet was lost in the Coyote Ground Water Basin, and about 28,000 acre-feet was removed from storage in the Llagas Ground Water Basin.

Accumulated Overdraft

The accumulated overdraft represents the loss in ground water storage between a desirable elevation of the ground water table and its present elevation. It is not a measure of the amount of overdraft under present conditions but merely relates the noted change in storage of ground water. If it is assumed that the water table elevations in 1942 were close to those required for safe operation in the Santa Clara Valley and Llagas Ground Water Basins, then the change in storage from 1942 to the end of the 1963-64 water year is the accumulated overdraft. It was computed to be about 707,000 acre-feet for the Santa Clara Valley Basin and about 7,500 acre-feet for the Llagas Basin. In the Santa Clara Valley Basin the accumulated overdraft includes the removal of water from under the Bay which must be replaced when this basin is restored to a safe yield operation. In the Coyote Ground Water Basin the present (1964) ground water table is considered near a desirable elevation. Therefore, no accumulated overdraft was computed for this basin.

Average Seasonal Overdraft

The average seasonal overdraft is defined as the seasonal amount of water removed from a ground water basin that is not replaced by the long time average seasonal amounts of water supply had the present (or any particular year's) conditions of consumptive use, disposal, and supplemental supply existed during the long time period. In this study a hydrologic base period was selected to represent the long time average conditions of water supply. For the Santa Clara Valley, and Coyote Ground Water Basins, the base period was from 1935-36 through 1947-48 and for the Llagas Ground Water Basin from 1932-33 to 1947-48.

The basic hydrologic equation used to compute the average annual overdraft states that the water supply must equal the water disposal plus or minus a change in storage. The procedures followed in solving this equation are outlined in the previous Annual Survey Report on Ground Water Conditions in the Ground Water Conditions Chapter.

The conditions of water supply and disposal under present conditions in the zones and ground water basins of the District summarized in Table 2 were equated in the hydrologic equation and the resulting average annual overdraft is summarized in Table 3. In the Coyote Ground Water Basin the computed average seasonal overdraft under present (1964) conditions was small. This computed overdraft was based on the decrease in ground water storage that occurred during the base period. Since the present (1964) elevation of the ground water table is near the desirable level for agricultural pursuits, no overdraft or accumulated overdraft is considered to exist in that basin.

Section 26.5 of the District Act directs that in addition to determining the average annual overdraft for the previous water year, an estimate be made for the current and succeeding water years. Average seasonal overdraft estimates were made by adjusting the elements of water supply controlled by the activities of man to the current (1964-65) and succeeding (1965-66) water years and balancing the hydrologic equation. These estimated values of average annual overdraft for the zones or ground water basins of the District are also summarized in Table 3. It should be noted that during the 1964-65 water year an estimated 7,400 acre-feet of water imported through the South Bay Aqueduct will be recharged into the underground. In 1965-66 the amount of imported water to be recharged is expected to be 35,500 acre-feet.

TABLE 3

ESTIMATED AVERAGE SEASONAL GROUND WATER OVERDRAFT FOR THE ZONES OR GROUND WATER BASINS OF THE DISTRICT

In Acre-Feet

Ground Water Basin	Average Annual Ground Water Overdraft		
	1963-64	1964-65	1965-66
Zone W-1	45,700	38,000	10,000
Coyote	0	0	0
Llagas	10,800	11,000	11,000

Average Annual Overdraft for Past Ten Years

The average annual overdraft for the past 10 years was estimated by averaging the annual overdrafts for the beginning and end of this period. No attempt was made to evaluate the intervening years and a simple straight line projection was assumed to give reasonable results. For the Santa Clara Valley Ground Water Basin this average annual overdraft for the past 10 years is about 32,000 acre-feet, zero acre-feet for the Coyote Basin, and about 5,000 acre-feet for the Llagas Ground Water Basin.

GROUND WATER EXTRACTIONS

Although the ground water extractions do not appear in the hydrologic equation of water supply and disposal, the amount of water extracted from the basins of the District is an important factor in water resources management. For safe operation of the underground basins, extractions of water must be limited in quantity and location to the safe yield.

In general, reliable data on the amount of ground water extractions for agricultural uses is not available and estimates made were based on lands irrigated, crop type, and assumed seasonal irrigations. Fortunately, the large private water companies and municipal water systems keep good records and the estimates of municipal and industrial water extractions are more reliable. The use of ground water production statements submitted by ground water users in Zone W-2 as a requirement of the District's ground water charge for the first half of the 1964-65 water year have substantiated previous estimates of municipal and industrial water extraction. However, the agricultural ground water production statements in Zone W-2 for the same period were only about 50 percent of the previous estimates of agricultural water production. It does not appear that previous estimates could be that much in error and other factors such as the knowledge that ground water pumped would be charged for caused a reduction in agricultural ground water extractions. These possibilities must be considered in estimates of ground water extractions for the next year.

The amounts of estimated ground water extraction from the ground water basins of the District are shown in Table 4. The values shown for the water year 1963-64 reflect the actual conditions of water supply whereas the 1964-65 and 1965-66 estimates are based on average year conditions.

TABLE 4

ESTIMATED SEASONAL GROUND WATER EXTRACTIONS IN THE ZONES OR GROUND WATER BASINS OF THE DISTRICT in Acre-Feet

Ground Water Basin	Zone W-1	Coyote	Llagas	Total
1963-64				
Agric. Use	137,000	16,000	79,000	232,000
Urban Use	127,000	2,000	10,000	139,000
Total	264,000	18,000	89,000	371,000
*1964-65				
Agric. Use	101,000	13,000	64,000	178,000
Urban Use	138,000	2,000	11,000	151,000
Total	239,000	15,000	75,000	329,000
*1965-66				
Agric. Use	97,000	13,000	65,000	175,000
Urban Use	140,000	3,000	12,000	155,000
Total	237,000	16,000	77,000	330,000

*Estimates based on average water supply year.

WATER IMPORTATION PROGRAM

The District has entered into a contract with the State of California for a supplemental water supply to help overcome the overdraft. In 1965, the year of initial delivery, 25,600 acre-feet of water will be delivered through the South Bay Aqueduct to areas of ground water recharge along Penitencia Creek on the east side of the Santa Clara Valley Ground Water Basin and along Los Gatos Creek on the west side. In the following years the quantity of imported water will increase and additional areas of ground water recharge will be supplied by the growing In-County Water Distribution System now under construction by the District.

Because of the apparent limitations of the ground water basin aquifers to transmit the needed water supply to the areas of demand an increasing amount of the imported water supply will need to be treated and delivered to retail agencies for direct service to consumers. With the signing of contracts with the San Jose Water Works and the California Water Service Company in December 1964, for the delivery of treated water, this segment of the County-Wide Water Importation Program is moving forward. Water treatment plants should be under construction in 1966 and initial treated water delivery should be made early in 1967.

Recognizing the fact that the State of California may not be able to supply the future needs of the District for supplemental water through the South Bay Aqueduct, the Board of Supervisors of the District has expressed a desire to contract for additional future amounts of supplemental imported water with the United States Department of the Interior, Bureau of Reclamation. This water would be delivered through the San Felipe Division of the Central Valley Project. It would enter the District through a tunnel under Pacheco Pass and would pass north through the Llagas and Coyote Ground Water Basins to the base of Anderson Dam. Distribution systems would deliver this imported water to all three major ground water basins.

In the current water year (1964-65) about 7,400 acre-feet of supplemental water will be delivered to the Santa Clara Valley Ground Water Basin to help alleviate the average annual overdraft of 45,500 acre-feet. Based on the estimates of overdraft for the succeeding (1965-66) water year, about 69,000 acre-feet of water should be imported, including about 23,000 acre-feet of water to help alleviate the accumulated overdraft (planned elimination in 30 years). However, only 35,500 acre-feet of water will be available because of limitations in the receiving facilities.

Pricing Policy

To pay for the District's share of the South Bay Aqueduct and the In-County Distribution System required to distribute supplemental imported water, a limited county-wide ad valorem tax and a ground water charge for water extracted from the underground basin or delivered on the surface in lieu of extraction from Zone W-2 was levied in the water year 1964-65. In addition, charges will be made for the delivery of treated water that will repay all the costs of the treatment plants, their operation and maintenance, their share of the In-County Distribution System costs, and assigned ground water charge.

The Board of Supervisors of the District has adopted a policy to limit the ad valorem tax to five cents per 100 dollars of assessed valuation. A portion of this ad valorem tax is refunded to those areas using imported water from the Hetch Hetchy Aqueduct of the San Francisco Water Department in proportion to the amount of imported water used. The ground water charge for water extracted for agricultural purposes in Zone W-2 is limited by law to a maximum of five dollars per acre-foot. The charge for ground water extractions in Zone W-2 for purposes other than agricultural is limited by law to 20 dollars per acre-foot.

The policy adopted by the District Board of Supervisors on the delivery of treated water is that the treated water user will repay all the costs of treatment, half the costs of distribution, and the assigned non-agricultural ground water charge. The charges to be assigned for the delivery of treated water are fixed for a five year rate period with provisions for adjustment to reflect changes in the ground water charge component.

Costs and Revenues

In the current (1964-65) water year, the South Bay Aqueduct will be completed and begin delivering water to Santa Clara County. Payments must be made to the State for the District's share of the construction and maintenance charges for the completed aqueduct including an interim U. S. Bureau of Reclamation charge for water and operation costs for the scheduled delivery of water. An ad valorem tax of five cents per 100 dollars assessed valuation was levied by the District Board of Supervisors in the current water year (1964-65) and revenues collected including previous years' carryover amounted to $1,326,000. The District's share of the 1964-65 State charges for capital costs, maintenance, operation and Bureau water charge can be met from the ad valorem tax and other minor revenues. However, it is anticipated that during the ensuing (1965-66) water year that payments to the State will exceed $1,750,000 and revenues collected from the five cent ad valorem tax will be insufficient to pay the capital cost.

Therefore, it will be necessary to obtain revenues from other sources, including the ground water charge, to meet estimated payment commitments.

During the ensuing (1965-66) water year, all repayment obligations, other than the capital cost of the South Bay Aqueduct, will have to be met from the ground water charge. As previously noted ground water production reported for the first half of 1964-65 for agricultural and non-agricultural water users fell short of conservative estimates made by the District based on ground water extraction from Zone W-1 as reported in Table 4. Consequently, the revenues collected fell short of estimates, with revenues from agricultural production approaching only 50 percent of District estimates. Revenues from non-agricultural users nearly equaled estimates made by the District indicating that ground water extraction estimates for this use are reasonably reliable. In order to account for the variance between the estimated and reported ground water production for future revenue periods, it is recommended that the estimates of production be adjusted so that total required revenue is obtained. The recommended adjustment is shown in Table 5.

TABLE 5

ESTIMATED GROUND WATER PRODUCTION FOR 1965-66 IN ZONE W-2

Values in Acre-Feet

Use	Estimated		Reported	Recommended
	1964-65	1965-66	1964-65*	Est. for 1965-66
Agricultural	101,000	97,000	47,000	45,000
Other Than Agricultural	138,000	140,000	126,000	128,000

*Based on assumption that ground water production reported for first six months of 1964-65 represented 35 percent of the annual agricultural ground water use and 55 percent of uses other than agricultural.

The engineering and construction costs of the In-County Water Distribution System, including the water treatment plant costs, will be paid from the proceeds of the $42,050,000 bond issue passed by the electorate of Zone W-1 in June 1963. Bonds sold will be repaid with revenues from the ground water charges and the sale of treated water. The first sale of bonds in January 1964 totaled $15,500,000. It will be repaid at a rate of $710,900 to $767,000 per year over a 39 year period.

Construction of the Central Pipeline, the first phase of the In-County Water Distribution System, will be completed in the current water year. The engineering design of the second phase of the System, the Almaden Valley Pipeline - Unit I, is completed and the project advertised for construction bids in March 1965. Engineering design work on the third phase, the Rinconada Water Treatment Plant, interconnecting force main to the Central Pipeline, and treated water distribution pipeline, is under way and construction on these units should start early in 1966. Expenditures for this work will exceed the proceeds from the first sale of bonds and a second sale will be conducted during 1965-66.

The estimated expenditures during the ensuing (1965-66) water year are tabulated in Table 6.

TABLE 6

ESTIMATED EXPENDITURES DURING 1965-66

Purpose	Estimated Expenditure
State of California	
Capital Cost	$1,260,000
Operation & Maintenance	270,000
Bureau Water	235,000
District Expenses	207,000
Bond Redemption	
Series A	761,000
Series B	202,000
Total	$2,935,000

Recommended Ground Water Charges

The total estimated expenditures during 1965-66 will be paid from current revenues, the ad valorem tax and ground water charges. It is estimated that the five cents per 100 dollars assessed valuation ad valorem tax will raise a net amount of about $720,000.[1] This leaves about $2,215,000 to be raised by the ground water charge. Applying the $5.00 per acre-foot rate to the recommended estimate of agricultural ground water production from Table 5, about $225,000 would be raised. The remainder required to be assessed against the ground water production for uses other than agriculture indicates that this ground water charge will have to be $15.54 per acre-foot.

It is apparent that the ground water charge for water extracted for uses other than agricultural uses will vary each year as the expenses vary. Projections of estimated expenditures indicate that if this ground water charge were set at $16.00 per acre-foot it would be possible to leave it at this level for as long as four years. In the initial year a surplus or reserve would be built up that would cover the deficit in the latter years of this period. From the user standpoint it would be desirable to have a level rate so that business expenses could be programmed; this is particularly true for the public utilities who have to appear before the State Public Utilities Commission for each change in rate structure needed to cover changes in expenses. Therefore it is recommended that the ground water charge for water extracted for uses other than agricultural uses be set at $16.00 per acre-foot for 1965-66. Additional substantiating data will be available at the public hearing showing the magnitude of the early year reserve and the latter year deficit to be expected under this type of level rate program.

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[1] The ad valorem tax is estimated to raise a total of $854,000, but under the pricing policy adopted before the bond issue, a portion of this revenue will be returned to those cities obtaining all or a part of their water supply from the Hetch-Hetchy Aqueduct. This rebate is estimated to amount to $134,000 leaving a net revenue of $720,000.

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

Pursuant to Section 26.5 of the Santa Clara County Flood Control and Water District Act, an investigation of the ground water conditions of the District and Zones thereof has been completed. This chapter presents a summary of the findings derived from the results of this investigation and recommendations based upon these findings.

Summary of Findings

1. The major ground water basins of the Santa Clara County Flood Control and Water District are the Santa Clara Valley Ground Water Basin in the northern portion of the County, the Coyote Ground Water Basin in the center of the District, and the Llagas Ground Water Basin in the southern portion of the District.

2. A water importation zone, Zone W-1, was established on September 11, 1962 and a ground water charge zone, Zone W-2, was established on February 11, 1963. Both zones are essentially coterminous and include most of the Santa Clara Valley Ground Water Basin within their boundaries.

3. The average seasonal water supply available to the zones or ground water basins of the District under present (1964) conditions is:

Zone W-1	441,300 acre-feet
Coyote G.W.B.	86,400 acre-feet
Llagas G.W.B.	166,000 acre-feet

4. The average seasonal water disposal including consumptive use in the zones or ground water basins of the District under present (1964) conditions is:

Zone W-1	487,000 acre-feet
Coyote G.W.B.	87,200 acre-feet
Llagas G.W.B.	176,800 acre-feet

5. Under the present (1964) conditions of water supply and water disposal, overdraft conditions exist in two of the three major ground water basins of the District. The average seasonal overdraft in acre-feet for the preceding (1963-64), current (1964-65) and ensuing (1965-66) water years is estimated to be:

Zone W-1	45,700	38,100	10,400
Coyote G.W.B.	0	0	0
Llagas G.W.B.	10,800	11,000	11,000

6. The accumulated overdraft represented by the change in ground water storage between the ground water table elevation in 1942 (assumed desirable) and 1964 is estimated to be:

Zone W-1	707,000 acre-feet
Coyote G.W.B.	0 acre-feet
Llagas G.W.B.	7,500 acre-feet

7. The primary source of water put to beneficial use in the zones or ground water basins of the District is ground water and the total extractions in acre-feet of ground water during the preceding (1963-64), current (1964-65) and ensuing (1965-66) water years is estimated to be:

Zone W-1	264,000	239,000	237,000
Coyote G.W.B.	18,000	15,000	16,000
Llagas G.W.B.	89,000	75,000	77,000

8. The estimated amount of ground water to be extracted for agricultural use from the zones or ground water basins of the District during the ensuing (1965-66) water year is:

Zone W-1	97,000 acre-feet
Coyote G.W.B.	13,000 acre-feet
Llagas G.W.B.	65,000 acre-feet

9. The estimated amount of ground water to be extracted for uses other than agricultural use from the zones or ground water basins of the District during the ensuing (1965-66) water year is:

Zone W-1	140,000 acre-feet
Coyote G.W.B.	3,000 acre-feet
Llagas G.W.B.	12,000 acre-feet

10. A program for the importation of supplemental water to help alleviate the annual and accumulated ground water

overdraft in the Santa Clara Valley Basin has been formulated and a contract signed with the State to supply a maximum annual amount of 100,000 acre-feet. Initial deliveries are to be made in early 1965 from the South Bay Aqueduct.

11. An In-County Water Distribution System to deliver the imported water to the points of ground water recharge and surface delivery treatment plants in Zone W-1 is being designed. Construction of the Central Pipeline will be completed in the current (1964-65) water year and engineering design of the Almaden Valley Pipeline - Unit I is complete and the project was advertised for bids in March 1965.

12. Contracts have been signed for the initial delivery of treated water in early 1967 and design has started on the Rinconada Water Treatment Plant, the interconnecting force main with the Central Pipeline, and the treated water pipeline (West Pipeline).

13. The registration of wells in Zone W-2 is complete, water production statements for the first half of the current water year have been filed, and a ground water charge has been collected.

14. Expenditures for the District's share of the cost of construction, maintenance and operation of the South Bay Aqueduct, including the Bureau Water Charge, in the ensuing (1965-66) water year are estimated to amount to

$1,765,000. Bond redemption charges during the ensuing (1965-66) water year are estimated to amount to $963,000.

15. A county-wide ad valorem tax of 5 cents per 100 dollars assessed valuation will not provide sufficient revenues in the ensuing (1965-66) water year to meet the anticipated expenditures.

16. A ground water charge based on estimated production of water from the ground water supplies in Zone W-2 of five dollars per acre-foot for agricultural extractions and $16.00 per acre-foot for non-agricultural extractions is necessary to meet anticipated expenditures in the ensuing (1965-66) water year and provide a limited reserve.

Recommendations

Based on these findings it is recommended:

1. That the District continue expeditiously its engineering design work on the remainder of the In-County Water Distribution System including the treated water facilities in order to complete the system in time for distribution of imported water available from the South Bay Aqueduct and delivery of treated water as committed by contract.

2. That a county-wide ad valorem tax of 5 cents per 100 dollars assessed valuation be continued for the ensuing (1965-66) water year and collected to pay a portion of the anticipated charges for the District's share of the construction of the South Bay Aqueduct.

3. That a ground water charge of five dollars per acre-foot for agricultural extractions and $16.00 per acre-foot for non-agricultural extractions be levied and collected in Zone W-2 for the ensuing (1965-66) water year to pay the remaining charges to the State and the bond redemption charges for the In-County Water Distribution System, and to provide a limited operating reserve.

4. That the District Board of Supervisors make the following determinations for Zone W-2 in accordance with

Section 26.6 of the District Act:

a. The average annual overdraft as determined by the long term overdraft under present conditions for the immediate past 10 water years is about 32,000 acre-feet.

b. The estimated annual overdraft for the current (1964-65) water year is about 38,100 acre-feet.

c. The estimated annual overdraft for the ensuing (1965-66) water year is about 10,400 acre-feet.

d. The accumulated overdraft as of the last day of the preceding (1963-64) water year is about 707,000 acre-feet.

e. The estimated accumulated overdraft as of the last day of the current (1964-65) water year is about 745,000 acre-feet.

f. The adjusted estimated amount of agricultural water to be withdrawn from the ground water supplies of Zone W-1 for the ensuing (1965-66) water year is about 45,000 acre-feet.

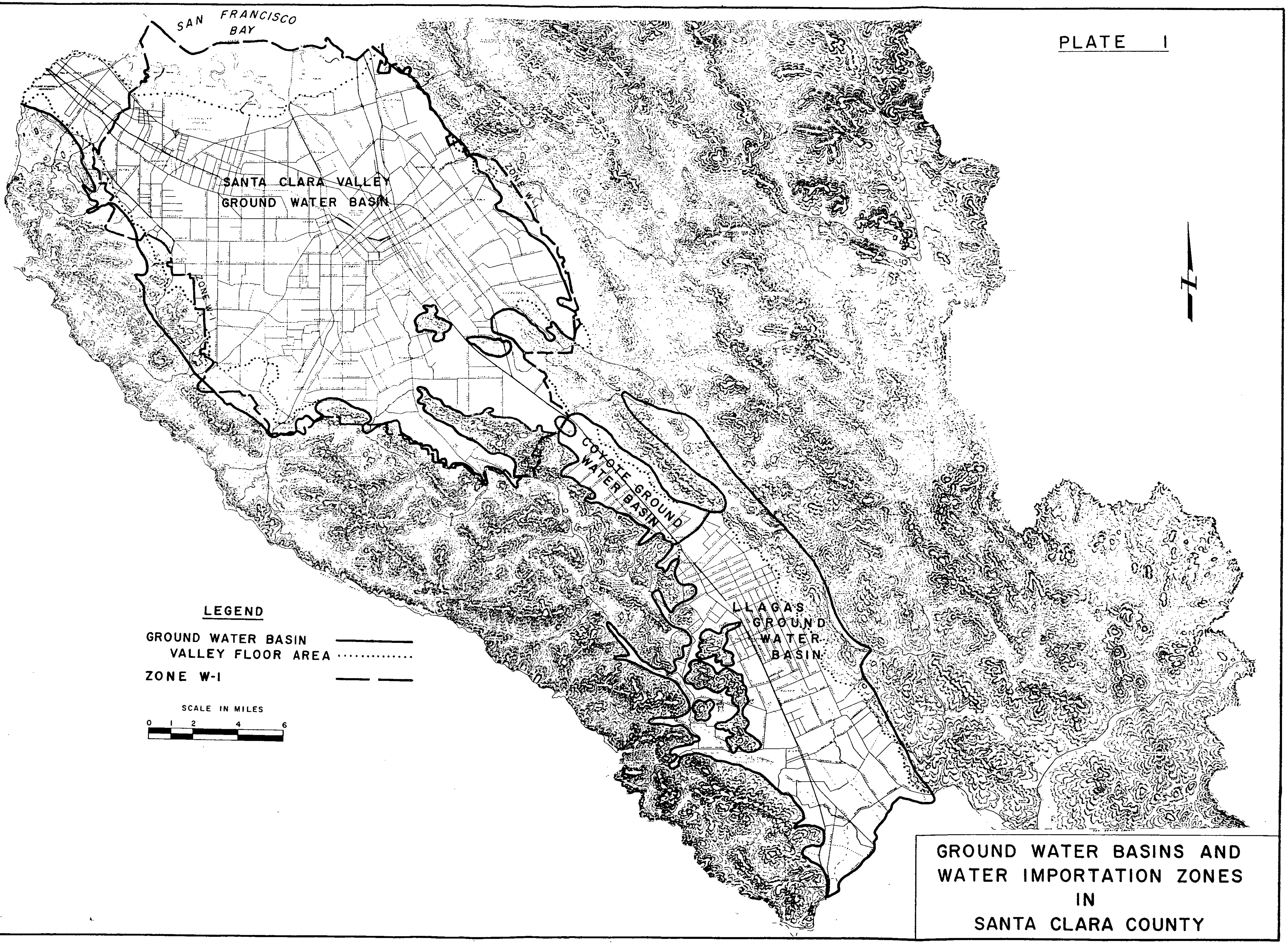
g. The adjusted estimated amount of water other than agricultural water to be drawn from the ground water supplies of Zone W-1 for the ensuing (1965-66) water year is about 128,000 acre-feet.

h. Imported water supplies will be available to the District in the ensuing (1965-66) water year but without water treatment only about 500 acre-feet of water can be delivered on the surface; this would be for irrigation.

i. If available, about 69,000 acre-feet of supplemental water should be imported to recharge the ground water basins of Zone W-1 in the ensuing (1965-66) water year. However, only about 35,500 acre-feet of water is scheduled to be imported through the South Bay Aqueduct for replenishment of the ground water supplies in the ensuing (1965-66) water year.

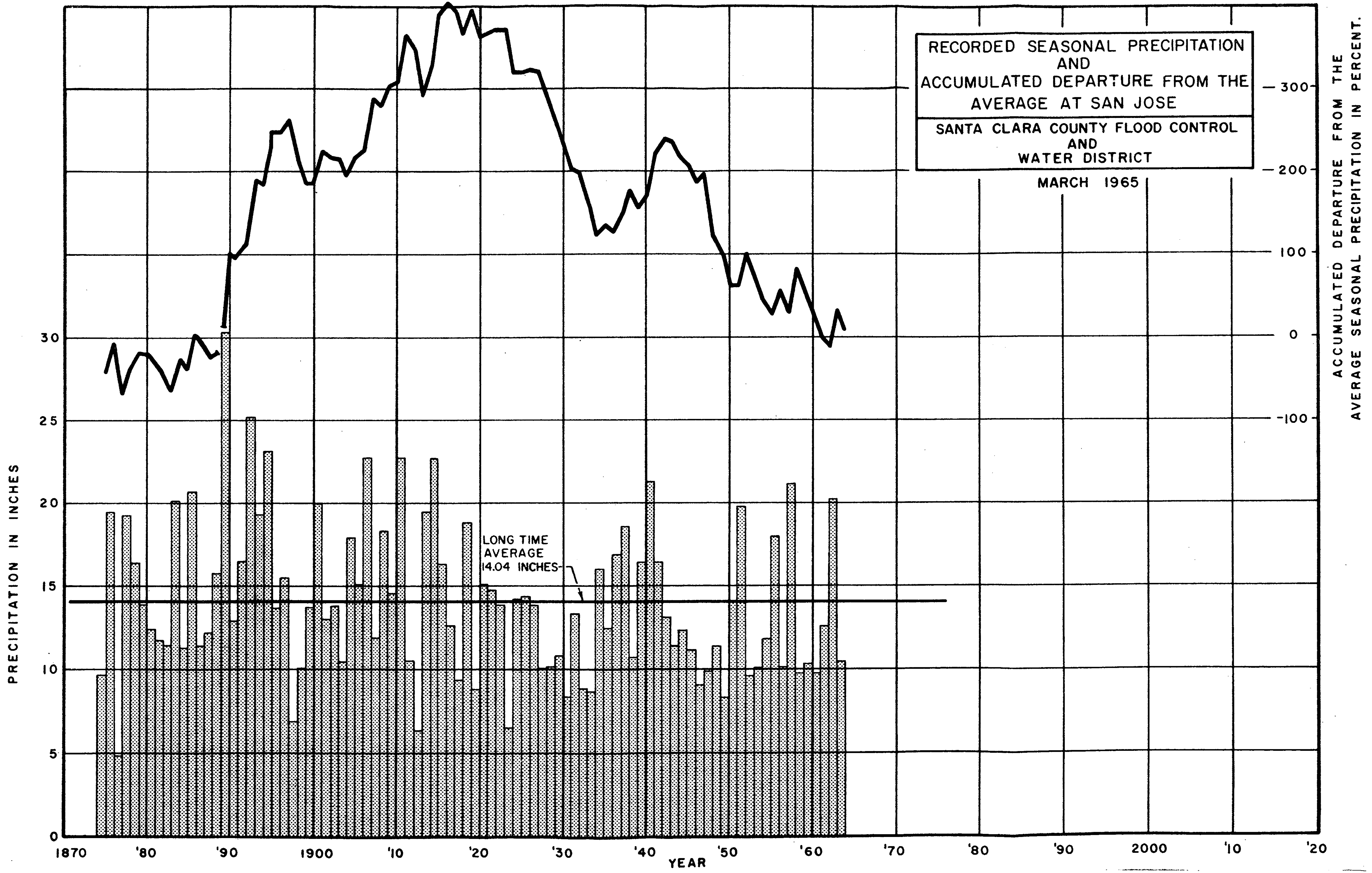
j. The District is obligated by contract to purchase about 35,500 acre-feet of water in the ensuing (1965-66) water year.

PLATE I



GROUND WATER BASINS AND WATER IMPORTATION ZONES IN SANTA CLARA COUNTY

PLATE 2

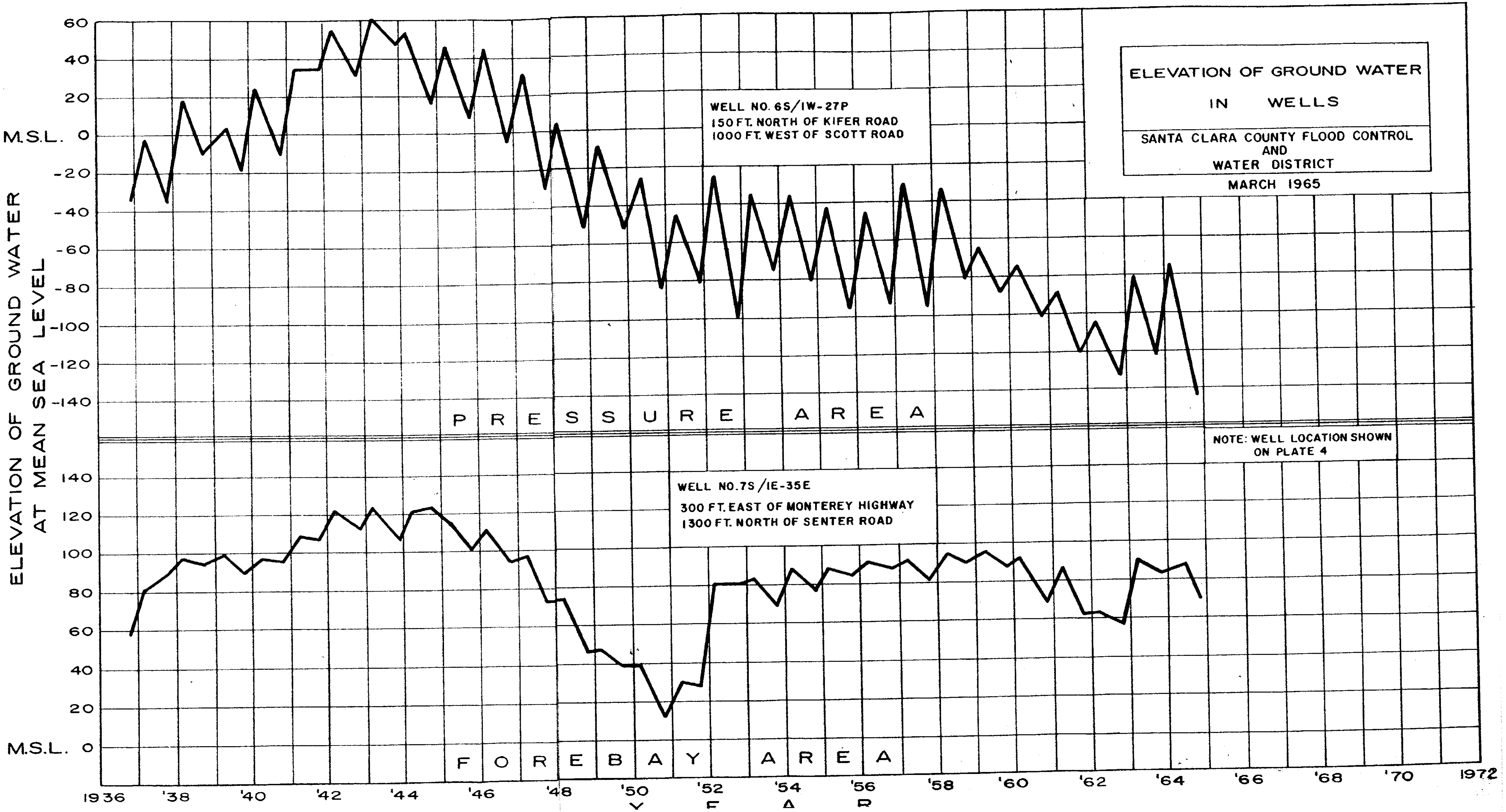


RECORDED SEASONAL PRECIPITATION
AND
ACCUMULATED DEPARTURE FROM THE
AVERAGE AT SAN JOSE

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

MARCH 1965

PLATE 3


ELEVATION OF GROUND WATER
IN WELLS
SANTA CLARA COUNTY FLOOD CONTROL AND WATER DISTRICT
MARCH 1965
WELL NO. 6S/1W-27P
150 FT. NORTH OF KIFER ROAD
1000 FT. WEST OF SCOTT ROAD
PRESSURE AREA
NOTE: WELL LOCATION SHOWN ON PLATE 4
WELL NO. 7S/1E-35E
300 FT. EAST OF MONTEREY HIGHWAY
1300 FT. NORTH OF SENTER ROAD
FOREBAY AREA
ELEVATION OF GROUND WATER AT MEAN SEA LEVEL
60
40
20
M.S.L. 0
-20
-40
-60
-80
-100
-120
-140
140
120
100
80
60
40
20
M.S.L. 0
1936
'38
'40
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'44
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'58
'60
'62
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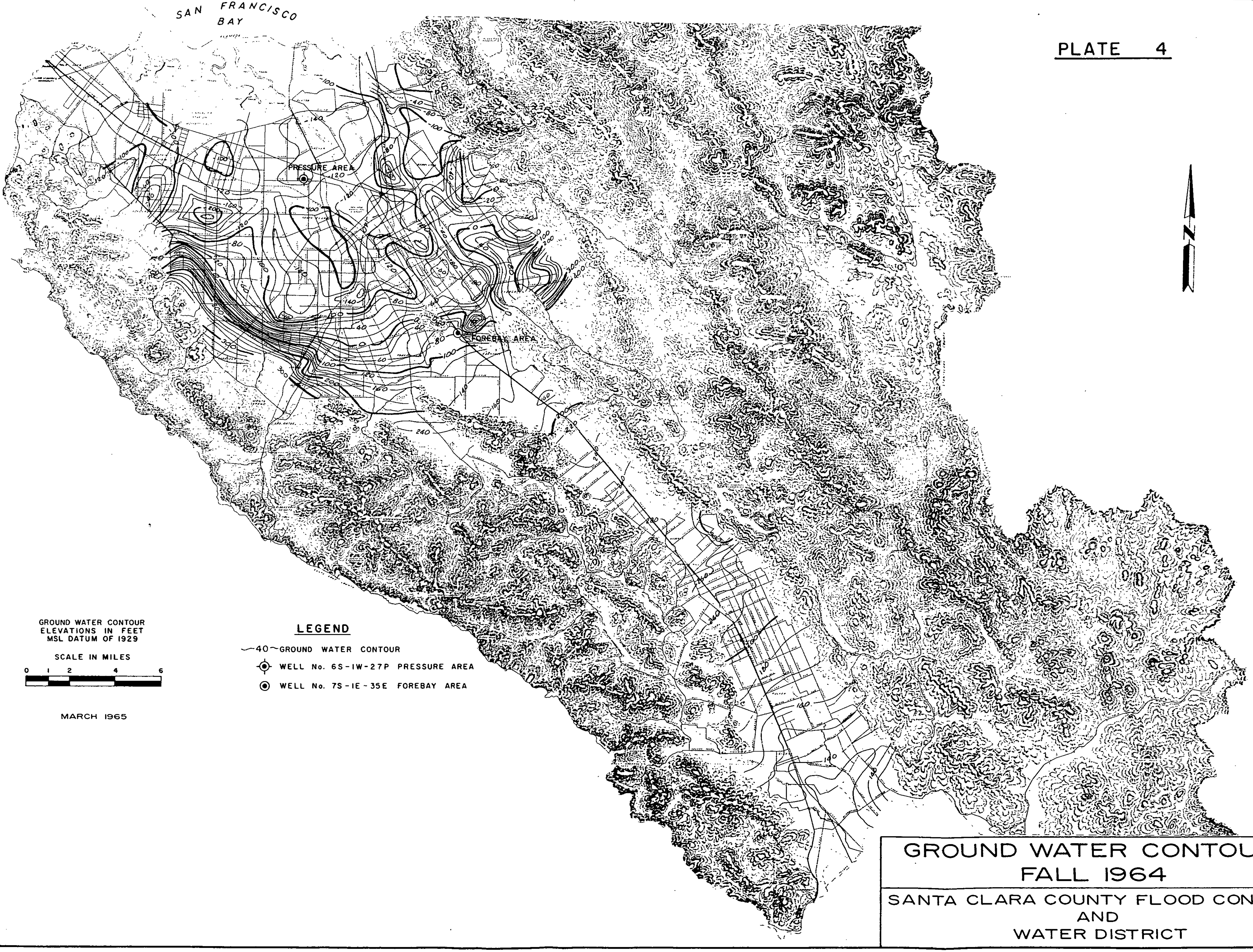
'66
'68
'70
1972

PLATE 4


SAN FRANCISCO BAY
PRESSURE AREA
FOREBAY AREA
N
GROUND WATER CONTOUR ELEVATIONS IN FEET MSL DATUM OF 1929
SCALE IN MILES
0 1 2 4 6
MARCH 1965
LEGEND
40 GROUND WATER CONTOUR
WELL No. 6S-1W-27P PRESSURE AREA
WELL No. 7S-1E-35E FOREBAY AREA

GROUND WATER CONTOURS
FALL 1964

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